

15 HAIR ROOT EVALUATION FOR STR ANALYSIS		Page 1 of 5
TRAINING PROGRAM FOR THE ANALYSIS OF FORENSIC CASEWORK USING PCR-BASED STR FLUORESCENCE IMAGING ANALYSIS AT THE POWERPLEX® 16 BIO LOCI		Amendment Designator:
		Effective Date: 13-March-2006
15	HAIR ROOT EVALUATION FOR STR ANALYSIS	
15.1	GOALS:	
15.1.1	To become familiar with the microscopic structures of hair.	
15.1.2	To become acquainted with the basic differences in human and animal hairs.	
15.1.3	To understand the fundamentals of hair biology as it relates to hair growth, regression and rest.	
15.1.4	To recognize the microscopic characteristics of human hair roots in the growth, regression and rest stages.	
15.1.5	To recognize those hair root forms which may be suitable for STR typing based upon their microscopic morphology.	
15.1.6	To become familiar with the preparation of temporary microscope slides containing hairs.	
15.1.7	To become familiar with photomicroscopic documentation of hairs.	
15.2	TASKS:	
15.2.1	Attend 4 lectures:	
15.2.1.1	Hair Biology; Hair Microscopic Examination and Hair Root Evaluation for Nuclear DNA Typing	
15.2.1.2	Stereomicroscopic Views of Human Hair Roots	
15.2.1.3	Hair Evaluation for Nuclear DNA Typing (Examples)	
15.2.1.3.1	Part I: Animal versus Human versus Textile Fiber	
15.2.1.3.2	Part II: Root Suitability for STR Typing	
15.2.1.4	Use of the digital camera with the compound microscope	
15.2.2	Examine and sketch from reference slides the microscopic appearance of at least 2 dog hair telogen roots absent tissue and at least 2 cat hair telogen roots absent tissue.	
15.2.3	Examine and sketch from reference human hair samples the microscopic appearance of:	
	<ul style="list-style-type: none">• Anagen/catagen head hair root bulb with attached follicular tissue• Anagen/catagen head hair root bulb absent attached follicular tissue• Telogen head hair root club with attached follicular tissue• Telogen head hair root club absent attached follicular tissue• Anagen/catagen pubic hair root bulb with or without attached follicular tissue• Telogen pubic hair root club with attached follicular tissue• Telogen pubic hair root club absent follicular tissue	

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<p>15.2.4 Trainee will gently remove several head hairs from their scalp, mount on temporary microscope slide; sketch and identify root forms. A microscopic root image will be captured with digital photography using a 20x objective; 10x ocular.</p> <p>15.2.5 Trainee will forcibly remove several head hairs from their scalp, mount on temporary microscope slide; sketch and identify root forms. A microscopic root image will be captured with digital photography using a 20x objective; 10x ocular.</p> <p>15.3 TRAINING EVALUATION</p> <p>15.3.1 Knowledge</p> <p>15.3.1.1 Review of trainee's sketches, notes and photographs by the training coordinator.</p> <p>15.3.1.2 Trainee will complete a practical exercise determining hair root suitability for STR typing using the compound microscope. Hairs in Perm mount on microscope slides.</p> <p>15.3.1.3 Trainee will complete a practical exercise determining hair root suitability for STR typing using the stereomicroscope. Hairs on post-it-notes.</p> <p>15.3.1.4 Review and discussion of the practical exercises by the training coordinator.</p> <p>REFERENCE MATERIALS:</p> <ol style="list-style-type: none"> 1. Microscopy of Hair, A Practical Guide and Manual. Hicks JW. FBI Publication Issue 2, Jan. 1977, U.S. Government Printing Office 1977-226-1201. 2. Human hair histogenesis for the mitochondrial DNA forensic scientist. Linch CA, Whiting DA, Holland MM. <i>J For Sci</i> 2001; 46(4): 844-853 (only pages 844-848). 3. Evaluation of the human hair root for DNA typing subsequent to microscopic comparison. Linch CA, Smith SL, Prahlow JA. <i>J For Sci</i> 1998; 43(2): 305-314. 4. Postmortem microscopic changes observed at the human head hair proximal end. Linch CA, Prahlow JA. <i>J For Sci</i> 2001; 46(1): 15-20. 	

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CHECKLIST FOR HAIR ROOT EVALUATION FOR STR ANALYSIS		
Name of Trainee: _____		
1. Trainee has attended lectures:		
<ul style="list-style-type: none"> • Hair Biology; Hair Microscopic Examination and Hair Root Evaluation for Nuclear DNA Typing 		
Date: _____	Training Coordinator: _____	
Comments: _____		
<ul style="list-style-type: none"> • Stereomicroscopic Views of Human Hair Roots 		
Date: _____	Training Coordinator: _____	
Comments: _____		
<ul style="list-style-type: none"> • Hair Evaluation for Nuclear DNA Typing (Examples) <ul style="list-style-type: none"> ○ Part I: Animal versus Human versus Textile Fiber ○ Part II: Root Suitability for STR Typing 		
Date: _____	Training Coordinator: _____	
Comments: _____		
<ul style="list-style-type: none"> • Use of the digital camera with the compound microscope 		
Date: _____	Training Coordinator: _____	
Comments: _____		
2. Trainee has examined and sketched the microscopic appearance from reference slides at least 2 dog hair telogen roots absent tissue and at least 2 cat hair telogen roots absent tissue.		
Date: _____	Training Coordinator: _____	
Comments: _____		

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3.

Trainee has examined and sketched the microscopic appearance of the following human hairs from the reference collection:

- Anagen/catagen head hair root bulb with attached follicular tissue
- Anagen/catagen head hair root bulb absent attached follicular tissue
- Telogen head hair root club with attached follicular tissue
- Telogen head hair root club absent attached follicular tissue
- Anagen/catagen pubic hair root bulb with or without attached follicular tissue
- Telogen pubic hair root club with attached follicular tissue
- Telogen pubic hair root club absent follicular tissue

Date: _____ Training Coordinator: _____

Comments: _____

4.

Trainee has mounted on temporary microscope slides, sketched and identified root forms for several hairs gently remove from trainee's scalp. A microscopic root image has been captured with digital photography using a 20x objective; 10x ocular.

Date: _____ Training Coordinator: _____

Comments: _____

5.

Trainee has mounted on temporary microscope slides, sketched and identified root forms for several hairs forcibly remove from trainee's scalp. A microscopic root image has been captured with digital photography using a 20x objective; 10x ocular.

Date: _____ Training Coordinator: _____

Comments: _____

6.

Trainee has read and understands all applicable literature.

Date: _____ Training Coordinator: _____

Comments: _____

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<p>7. Trainee has acquired the skills to successfully determine which hair roots may be suitable for STR analysis.</p> <p>Date: _____ Training Coordinator: _____</p> <p>Comments: _____</p> <p style="text-align: right;">◆END</p>	